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The "Mining and Scientific Press," of San Francisco, celebrated, with its issue of May 21, the 50th anniversary of its establishment as a publication. It is remarkable indeed that on the Pacific Coast, only eleven years after the pioneer days of '49, there was enough development and progress to justify the establishment of a journal devoted to mining. There are very few technical journals anywhere in the country that have attained the half century mark, and the "Mining and Scientific Press" has the distinction of being the pioneer journal devoted to the mining industry. The anniversary number contains much of historical interest, including contributions from such nestors of the profession as Dr. Raymond, Dr. James Douglas and the late Dr. William P. Blake. Under the present capable management of the journal is a powerful influence for sound engineering and sound finance in the field which it covers, and we extend to it our hearty wishes for another half century of prosperity.

CORRESPONDENCE.

An Explanation from the Author of "The Water Supply, Sewerage and Plumbing of Modern City Buildings."

Sir: The very full and on the whole favorable review of my book "The Water Supply, Sewerage and Plumbing of Modern City Buildings," published in Engineering News of March 17, 1910, has been forwarded to me here, and I thoroughly appreciate the courtesy which prompted you to give so much of your space to the review.

To a certain extent, the criticisms which you set forth are well taken—in fact, I anticipated them in my preface to the book. There are certain facts, however, of which your reviewer is not, and could not be informed, which I would like to have published and which I believe would tend to modify the views held by him. Hence I ask you kindly to give space to the following statement:

When in 1899 I undertook the writing of a book on "The Sanitary Engineering of Buildings" it was my intention to cover the subject completely in two large volumes. Only the first volume, however, was brought out by my publisher. Although I gave him the completed manuscript for the second volume some six or seven years ago, and thus fulfilled my part of a written contract agreement, he for reasons unknown to me, never published the second volume.

Thus the manuscript of the second volume was thrown on to my hands, and it was naturally a matter of impossibility to find another publisher for the second volume of my work. If the publisher of Vol. I., of this work had kept his agreement, I would never have found it necessary to publish the many other recent books of which your reviewer speaks. Under the circumstances, there seemed to be nothing left for me to do but to rearrange the manuscript matter, incidentally to amplify each part, and to divide it up into several separate works, with different titles. Thus it came about that in the past five years so "many different books" of mine, some as you state with duplications, came out, of which the ones on "Modern Baths and Bathhouses," on "Sanitation of Public Buildings," on "Sanitation, Water Supply and Sewage Disposal of Country Houses," and this last work of mine are the principal ones.

I kept silence on this point while the publisher in question was yet living. Now that he is dead there seems to be no reason why I should not publish the above facts in self-defence, and for the enlightenment of your reviewer and of those readers who take an interest in my publications.

Respectfully yours,

Wm. Paul Gerhard.

Guenterstal near Freiburg in the Black Forest, Germany, April 7, 1910.

REVIEWS.

American Producer Gas Practice.—A French Author on Marine Engines.

Reviewed by LIONEL S. MARKS,* M. Am. Soc. M. E.

AMERICAN PRODUCER GAS PRACTICE AND INDUSTRIAL GAS ENGINEERING.—By Nisbet Latta, M. Am. Soc. M. E., Author of "American Gas Engineering Practice." New York: D. Van Nostrand Co. Cloth; 7½ × 10¾ ins.; pp. 539; 247 illustrations in the text. $6, net.

COURS DE MACHINES MARINES.—Part II. Machines Alternatives, Turbines Marines, Moteurs à Combustion Interne. By L. Jauch and A. Masméjean, Professors in the Ecole des Mécaniciens at Toulon. Toulon, France: J. Altès. Paper; 6⅛ × 9¾ ins.; pp. 887; 545 illustrations in the text; 51 plates in separate volume, 7¾ × 10¾ ins. 30 francs; American price, $9.

The book which Mr. Latta submits to the "consideration of the American industrial world" is imposing in dimensions and in weight. It contains some 520 large pages on clay-filled paper and weighs over 5 lbs. One feels that the author must have an important message to justify so large a book.

The object of the author is perhaps best expressed in his own words. He says, speaking of himself:

> It has been his desire to, as nearly as possible, avoid scientific and technical language, to put before his readers in simple style gas producer engineering practice, as applied to every-day operations upon a practical and commercial basis, omitting any theorizing and laboratory results unsuited to actual commercial and manufacturing conditions. . . . It is his desire to make this handbook readable to the engineer, operator, and promoter, and to this end he has attempted to present in simple and elementary style the various subjects herein contained.

This preliminary statement of intentions prepares the reader for a lucid and well-arranged treatment. A careful perusal of the opening chapter on "Producer Operation" fails to reveal either of these characteristics. On the contrary, the treatment is extraordinarily baffling and the material is very poorly digested. It is true that the author has avoided scientific and technical language, but he has substituted for it something which is entirely his own and which in many places must be quite unintelligible to one who does not divine what he is trying to say. The difficulty is increased by his frequent misuse of words, by his habit of using the longest available word, by his invention of unnecessary new words to replace shorter common words, and by his inaccurate use of scientific terms. An example taken from the opening chapter will show some of the difficulties:

> Endothermic values of various agents apparently decrease with the sensible temperature. In the case of steam this is probably caused by the lessened amount of saturation, or entrained water contained at high temperatures, and the endothermic extraction of heat by such water due to the latent heat absorbed in transformation of water vapor into steam.

The author does not indicate whether he means increase or decrease of sensible temperature; he misuses the word saturation; he uses endothermic redundantly, since it means extraction of heat; and he creates a distinction between water vapor and steam.

A few lines lower we come across the statement that "the use of superheated steam . . . *subtends* intractable clinkers and excessive clinkering in water gas generators." Ordinary clinker is called "a clinker mass of incombustible vitrified scoria." In the discussion of the phenomena of the equilization of temperature between two bodies by radiation and conduction, in connection with the processes of "recuperation" of heat, there occurs the following paragraph:

> Here again must occur a balance between an initial velocity, which will apply to the absorbing material and the maximum amount of heat, and the time and space units of contact necessary for the absorption of this heat in working out this equation in exactness, lies the fundamental principle of all regenerative processes.

Such examples can be multiplied a hundred fold in a single chapter.

In the matter of arrangement it is difficult to see why the opening chapter of 48 pages on producer operations should contain nearly six pages of description of steam meters which have probably never been used and probably never will be used in the regular operation of a producer and which cannot themselves be considered as in anything but an early experimental stage for any use whatsoever. It is also difficult to see on what principle there is included in that chapter miscellaneous data on sizes, weights, thickness of shell, and other similar qualities. The principal objection, however, is that there is no apparent order. The author plunges into the middle of the subject, quotes extensively from numerous authorities (giving the page numbers but not the titles of the books from which he quotes) and meanders along without any evident general direction. For one who knows the subject it is generally possible to dig out the author's meaning, but it would certainly be extremely difficult for others.

The reviewer has dwelt at some length on these faults because they are typical of much that is happening in technical literatures to-day. Between the desire of the publishers to get hold of new technical material and the easy acquiescence of many engineers, the standards of technical writing have sunk very low. The rate of development of engineering practice is so rapid that it is not possible for an author to keep his manuscript as long as is desirable to get it well seasoned, without at the same time getting it out of date. But a reasonable standard of clearness at least is necessary if the book is to fulfill its purpose.

In spite of its serious faults the book contains much of value. It is not primarily intended for the gas-power engineer but for all the users of producer gas. In fact, the general industrial uses of producer gas are considered in more detail than is the power use.

Chapter II. is devoted to the apparatus and methods for cleaning the gas. Succeeding chapters deal with vaporizers and safety appliances; the construction, method of operation and performances of a number of typical producers; and the methods of moving gas. Then follow four chapters on the physical and chemical properties of solid and gaseous fuels, including methods of analysis of both. The next seven chapters deal with the use of producer gas in gas engines, for general industrial purposes, in furnaces and kilns, and for burning lime and cement. The construction and method of operation of the more common appliances is gone into with moderate completeness and the usual heat-saving devices are also included. The remaining chapters are devoted to a general discussion of heat phenomena; to pyrometry and calorimetry; to pipes, flues and chimneys; and to a discussion of the properties of some common materials. The almost inescapable "useful" tables are also present and help to pad a book which is already considerably too large.

There is much good material in this book and it is well illustrated. With the same material and the same knowledge of the subject in the hands of a writer who knew how to present his facts, this work would have proved valuable to all who have to deal with producer gas. As it is, it will still be of value to those who refer to

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it for information as to particular constructions or processes and who have already a general knowledge of the subject. But it is only as a book of reference that it is useful; to one who should decide to sit down and read through the book for the purpose of getting general information, there would probably come in return little but confusion of ideas and an aching head.

It is nearly always the case that a French technical treatise will show three special characteristics: clearness, good arrangement, and a comprehensive treatment. The work by Jauch and Masméjean, now under review, exhibits those characteristics to a marked degree, and it is with a very real sense of pleasure that one turns over its pages. It is the second volume of a projected three-volume treatise on marine machinery. The first volume dealt with steam boilers and accessories, and included a general discussion of the strength of materials and of thermodynamics. It was a large octavo book of 520 pages and 300 text figures, accompanied by an atlas of 37 large plates, and was reviewed in Engineering Literature Supplement of Engineering News for May 13, 1909. The third volume is to deal with auxiliary machinery. The present volume treats of reciprocating engines, turbines and internal combustion engines. It is a book of 900 large pages, with 541 text figures and is accompanied by an atlas of 51 plates, approximately 11 by 15 ins. in size.

The first 117 pages are devoted to a study of the materials used in the construction of engines; iron and steel, copper, bronze and other alloys. It is a very thorough discussion, introducing the valuable results of recent investigations of the metallurgist, the metallographist and the physical chemist. The use of Roozeboom's diagrams and the conclusions from it as to the heat treatment of steels; the still more recent diagram of Tchernoff dealing with heat effects; the mechanical treatment of steels, and the results of tests are among the subjects. This first part of the book constitutes by itself a very complete treatise for engineers on the constitution and properties of metallic materials.

It is impracticable in a short space to do much more than to suggest the topics discussed; they cover all the elements of the machinery, since nothing is left untouched. A casual example will suffice to indicate the completeness of the work. The subject of stuffing boxes for the pistons of reciprocating engines occupies 12 pages, of which two full pages are devoted to the composition, occurrence and properties of the different kinds of asbestos. The properties of the blue Canadian asbestos, of the yellow Russian variety, and the blue South African variety are considered, including their power of resisting heat and decomposition by acids, their densities, hygrometric qualities, elasticity, porosity, electric resistance and thermal resistance. And all this because of the use of asbestos in conjunction with other materials for stuffing-box packings.

The work is not only descriptive but contains also the mathematical discussion of almost every part of the subject that is at present susceptible of approximate mathematical analysis. The theory of design of the various parts for strength is given; and there is added much mathematical analysis of special things, such as the effect of the inertia of the moving parts of the steam-engine indicator on the accuracy of the indicator card; the deflection (under the action of gravity) of a rod or stretched wire when used between two supports for the purpose of leveling or lining up a machine. Besides the matters which are of importance for reciprocating engines in general, there is much that belongs particularly to the marine engine. The theory and design of propellers occupies 65 pages; the effects of lack of balance on the vibration of ships, the laws of similitude, and the deductions from experiments on small models of the power requirements for a vessel, and many similar special topics, are comprehensively discussed.

Marine steam turbines occupy about 130 pages. Here again it is difficult to choose any particular features for special notice, owing to the thoroughness with which the whole field is covered. There is a very valuable collection of all the available information on the performance of marine turbines. The last 130 pages are devoted to internal-combustion engines, including gas turbines. Besides the descriptive and thermodynamic parts there is much on the performance of these engines, naturally with particular reference to their adaptation to marine requirements. This last section is, perhaps, the least satisfactory of the book, but it is also for present day purposes the least important.

Summing up this volume as a whole, its chief feature is its encyclopedic character. It is the kind of work which appeals particularly to our French and German friends, but is practically never undertaken by English or American writers. It is interesting to speculate on the possible value of such a treatise for English-speaking students. It seems to the reviewer that it would not be acceptable to American students because of their less philosophical attitude of mind and their impatience of the slow, orderly development of the subject, which entails the complete clearing up of the underlying theories before the main part of the subject is attacked. Such an excellent English text-book as Sennett's "Marine Steam Engine," which has proved invaluable to many generations of students, seems somehow superficial beside this work—but it is certainly much better adapted to the mental processes and the attitude of mind of the Anglo-Saxon youth. Perhaps the treatise under review is not really intended as a text-book; used as a book of reference it will certainly prove valuable to all who have occasion to look into it.

Practical Housing Reform.

HOUSING REFORM.—A Hand-Book for Practical Use in American Cities. By Lawrence Veiller. New York: Charities Publication Committee. Cloth; 5¼ × 8 ins.; pp. 213. $1.25.

The subject of housing reform is here treated in an eminently sane and practical manner by a man who has been intimately connected with the campaign against tenement-house evils in New York City for a dozen years past, both as reformer and as responsible administrator of the new tenement-house laws, and who has also given much attention to the housing problems of other cities.

The author does not go into technical details. He first outlines the general subject by setting forth housing evils and their significance, and by discussing congestion and overcrowding. After dealing with these and related subjects, he tells how to start a movement for housing reform, gives the essentials of housing investigations and discusses model tenements.

The impracticability of solving the tenement-house problem by municipal construction and renting of tenements is set forth in a well-considered chapter, in which it is made clear that dependence must be had upon municipal regulation rather than upon municipal ownership.

Housing legislation and its enforcement is given three chapters. This subject is followed by a number of suggestions on securing legislative reforms, and by an exposition of services which private individuals and associations can render in the way of aiding municipal regulation. The volume is concluded by a chapter of "Don'ts" and by a few sample schedules for housing investigations.

In a brief "Foreword," Mr. Robert W. De Forest, who was the first Tenement House Commissioner under the new tenement-house law applying to New York City, states that

> no growing American city, however free from tenements now, can afford to be without building regulations to prevent dark rooms and unsanitary conditions. . . . There is nothing inherently objectionable in the tenement as a type of city dwelling; that is, in a multiple house intended to be occupied by three or more families living independently. The objection lies in permitting them to be built without proper regulation. It is the well-nigh universal form in many European cities. It is likely to be increasingly the form in American cities.

We have made these quotations in order to show that many of the suggestions in the book are of possible value in other than our larger cities. We may add in conclusion that for the benefit of those who wish to go into the details of tenement-house regulation, the author of this book has prepared a companion volume entitled "A Model Tenement House Law," which is also published by the Russell Sage Foundation. This model law has been so drafted as to be easily adapted for enactment as a state law or city ordinance in any part of the country.

A CONCISE TREATISE ON REINFORCED CONCRETE.—A Companion to "The Manual of Reinforced Concrete." By Charles F. Marsh, M. Inst. C. E., M. Am. Soc. C. E., M. Inst. M. E. New York: D. Van Nostrand Co. Cloth; 5½ × 8¾ ins.; pp. 225; 67 illustrations, mostly in the text. $2.50, net.

Marsh & Dunn's "Reinforced Concrete," published first in 1904 (Eng. News, Jan. 12, 1905), was one of the earliest of the now numerous texts on the subject. On account of its great size (a quarto volume of 545 pages with 512 illustrations) and partly because of the rapid advance in the knowledge of and experiments upon concrete, the authors in 1908 issued a smaller and revised edition of the original work, entitled "Manual of Reinforced Concrete" (Eng. News, Nov. 12, 1908), which omits any extended discussion of properties or experiments and includes only the necessary material for design. Now, Prof. Marsh supplements this last book with the one noted in the headpiece above.

This latest treatise does not consider the practical designing end at all, but confines itself entirely to the experimental and theoretical considerations that govern design. Its nature is well shown by the four main subject headings: Properties, Behavior Under Loading, Assumptions for the Purposes of Calculation and Methods of Calculation. It is a careful exposition of the underlying elements of reinforced concrete design, with the very fullest mathematical accompaniment. In connection with the "Manual," it quite fully covers the field of design, though neither book more than touches the equally important subject of construction.

THE PRINCIPLES AND PRACTICE OF IRONFOUNDING.—By E. L. Rhead, Lecturer in Metallurgy, Municipal School of Technology, Manchester. Manchester, England: The Scientific Publishing Co. Cloth; 5¼ × 8¾ ins.; pp. 505; 247 illustrations in the text. 7s. 6d., net; American price, $3.

Based on a course of lectures given annually by the author at the Manchester (England) Municipal School of Technology, this book is especially strong in metallurgy. More attention is given to materials and devices used than to the manual operations involved. The book is written more from the standpoint of the foundry superintendent than from that of the molder.

It should not be inferred, however, that molders would derive no benefit from the book or that it is objectionably theoretical. It is written in a clear and simple style and is particularly commendable in this respect in its explanations of the qualities of cast-iron and the effects produced on it by different elements in varying quantities. Throughout the book, the attempt has been made to refer things back to underlying principles, to point out causes as well as effects and thus to lay in the reader's mind the basis for an intelligent comprehension of the art of iron founding.

Less space than is usual in such books is given to the molding of specific patterns and more space is devoted to explaining the causes of the troubles encountered in practical work.

MISCELLANEOUS TESTS OF ELECTRIC CAR EQUIPMENT.—By Eugene C. Parham, M. E., and John C. Shedd, Ph. D. New York: McGraw-Hill Book Co. Cloth; 5 × 7½ ins.; pp. 156; 74 illustrations in the text. $1, net.

This volume is the second written by the authors to present common useful tests of electric-car equipment and performances. These tests may, in many cases, be described as the "rough-and-ready" kind for men with only limited equipment at their disposal. The condition tests outlined are both mechanical and electrical and cover the collectors, controllers, circuit breakers, circuits and auxiliary devices, motors and motor parts. There are operation tests also for inspecting the motor equipment and for determining efficiency, together with miscellaneous tests, such as to determine acceleration, retardation, train resistance, etc. As a sort of appendix are rules for reviving shocked persons and for relieving burns.

A Text-Book on Construction from Australia.

Reviewed by ROBERT FLETCHER,* M. Am. Soc. C. E.

ENGINEERING CONSTRUCTION IN STEEL AND TIMBER.—By William Henry Warren, M. Inst. C. E., M. Am. Soc. C. E., Challis Professor of Engineering and Dean of the Faculty of Science and Engineering, University of Sydney. Second edition. London, New York and Bombay: Longmans, Green & Co. Cloth; 5¾ x 9½ ins.; pp. 472; 10 plates and 452 text illustrations. $5, net.

The first edition of this work appeared in 1894. In a brief preface the author calls attention to the great amount of additional data on the physical properties of materials of construction made available during the past fifteen years, which required the re-writing of the first two chapters (77 pp.). Other changes noted by him are: Use of influence lines for treating bending moments and shear, in Chapter IV. (pp. 87 to 111); more modern examples of timber structures, given in Chapter V. (17 pp.), wherein he admits obligations to Wolcott C. Foster's "Treatise on Wooden Trestle Bridges"; in Chapter X., deflection of beams, due to shearing stresses, and also deflection of trusses and girders (31 pp.); in Chapter XI. (25 pp.), treatment of continuous girders by influence lines, and three pages of text and one of figures devoted to cantilever trusses; expansion of Chapter XII. (37 pp.) and XIII. (30 pp., on strength of columns and riveted joints; Chapter XIV., on wind pressure, centrifugal action and action of brakes, rewritten (9 pp. in all); an entirely new chapter on the loading of bridges; new worked-out designs for "plate web" girder deck bridge, Pratt truss bridges and a "Parker" or curved upper chord subdivided panel railway bridge in Chapters XVII. to XIX. (43 pp.), for which he acknowledges large indebtedness to the American Bridge Co. Chapter XXI. (pp. 403 to 461) treats of the design of arched and suspension bridges.

A treatise of this size, covering so wide a field, must be simply a resumé in greater or less degree of the subjects treated. Perhaps it cannot be correctly judged without knowing the class of readers for whom it was intended. The author hopes "that the book in its present form will be found more generally useful to the student and the engineer." For the student it would need considerable elucidation in the classroom by a competent instructor. The engineer who would find it practically useful must be already well grounded in theory, and familiar with the essential data and experiments on which correct use of theory depends. Either class would have to consult freely the authorities cited, and others; but any engineer who has lacked opportunity to keep informed as to more recent advances in these directions may find the book to be a helpful compendium and conspectus.

The first chapter treats briefly of the strength, elasticity, resilience and fatigue of cast-iron and steel and of the determination of the safe working stresses in structures of these materials. Instead of the term elastic limit the author uses "limit of proportionality." Thurston and Beardslee are quoted on elevation of the elastic limit by overstrain; also Muir, who raised the yield point after overstrain, by immersion of pieces of steel in a bath of boiling water. In developing the theory he refers to Martens' Handbook and Unwin's treatise on testing of materials of construction; to reports of the International Society for Testing Materials; to the Philosophical Transactions and Proceedings of the Royal Society; to Johnson's "Materials of Construction"; to the British Standard Specifications for drop tests of railway rails, axles, etc. Mesnager's conclusions on results of his experiments on notched bars subjected to impact, are given in full. Brinell's method of testing hardness is described. Hill's experiments on effects of punching and shearing (Trans. Western Soc. Engr., 1880) are noted in a short paragraph. The microscopic structure of steel and structure shown by etching are treated in six pages, condensed from Howe on "Iron, Steel and other Alloys." The author gives results of his own and Turneaure's and Cuenot's (Annales des Ponts et Chausées, July, 1891) experiments on effects of train loads on bridges; also those of Rabut in France, M. A. Howe in the U. S., and Stone in India. Fatigue formulas and unit working stresses as adopted by leading American and British engineers are given and discussed.

Chapter II., on Timber, is a collection of results of tests presented in 14 tables collated chiefly from Hatt, Lanza and Watertown Arsenal Reports, with a table from Kirkaldy and an extensive table of results of tests of timbers of Australasia. On the preservation of timber only a single page is given; seven methods being mentioned, but only four described in short paragraphs.

Chapter III. gives a meager treatment of the very elementary principles of graphic statics and determination of stresses in braced structures by the method of sections. But this is introductory to what follows in later chapters. Chapter IV. deals with bending moments and shearing forces in beams, and is similar to the familiar treatment of the same in "Cambria Steel," with some amplification. The last seven pages present the methods of treatment by influence lines, both for beams and trusses, chiefly to develop the criteria for maximum moment, shear, etc.

Chapter V. gives a sufficiently full and satisfactory treatment of the moment of resistance of beams and the distribution of shearing stress in the cross-section. In discussing the modulus of the section, 16 neat figures of uniform stress are given for as many different sections. If the table of properties of rolled steel I-beams manufactured by Messrs. Dorman, Long & Co., is intended as a model, it lacks much in completeness as compared with the tables in any one of the leading American handbooks in structural shapes.

Chapter VI., which has been referred to already, gives three examples of wooden girder bridges on wooden pile piers as built of Australian timber: One for highway traffic with girder spans of 30 to 40 ft. or more, one for a low bridge over wet ground and one for the heaviest railway traffic. An example of an American high trestle of squared timbers is given in Chapter XV. Pile driving is discussed in about a page and Wellington's formula exclusively recommended. According to the chapter heading, short-span steel bridges are included. This is fulfilled in a single page illustrating and giving computations for a railroad bridge of four 18-in. I-beams for a clear span of 16 ft. A single page is given to bolts, washers, spikes and screws and their holding power, and another to painting of timber, all in relation to these structures. A reference to tables and data in familiar engineers "pocket-books would have been in order here.

Chapter VII. shows the application of graphic statics to determine the stresses in four different forms of roof truss and one crane frame. Chapter VIII. gives the usual treatment of methods for finding the stresses in "braced girders with parallel flanges," with numerical solutions. Similarly, Chapter IX. deals with bowstring girders; and, on two pages, the analysis of a Pratt truss with subdivided panels is barely indicated, and an illustration shows "a truss derived from a Parker truss" as designed by the American Bridge Co. These three chapters cover 38 pp.

Chapter X. develops the usual formulas for the elastic deflection of beams in 14 pages. The principle of work applied to the deflection of beams and trusses is discussed in ten pages more, for which considerable matter is derived from Hudson's paper (Trans. Am. Soc. C. E., May, 1903), wherein variable moment of inertia is considered. Hudson's conclusions for swing or drawbridges are stated. The influence of J. B. Johnson's discussion of the relative effect of verticals and diagonals on deflection of trusses, and the necessity of including such effects, is evident. Johnson's formulas for elastic and inelastic deflection are given. The usual tabular view of moments, deflections and stresses in beams, by formulas, is presented in three pages.

In Chapter XI., on continuous girders, etc., the equation of three moments is assumed without proof, and application made by numerical examples to a railroad bridge and a warehouse floor. The methods of treating such cases by influence lines are then developed, and for the numerical solutions the forms usually derived from the three moment equations are utilized without demonstration. Cantilever bridges are noticed by giving principal dimensions of three bridges and the Forth Bridge, allusion to three others by name, a brief statement of characteristics and advantages, and two pages and two illustrations relating to competitive designs for such a bridge for Sydney Harbor.

Chapter XII. presents the usual theory for strength of columns with two tables by Fidler. Then follows an exhibit of the results of tests of full-sized built-up columns at Watertown Arsenal on six pages, with isometric sketches of the six types tested. Moncrieff's investigations are described and his results given at length. Finally, the various expressions for column formulas are given, four forms for timber columns, and the method of designing a pin-ended column by a numerical example; closing with a four-page tabular exhibit of areas, moments of inertia, etc., of seven solid sections and eight typical built-up sections. No reference is made to built-up chord-sections of great length like those of the Queensboro Bridge and those which failed in the Quebec Bridge, nor to the discussion following that catastrophe.

In Chapter XIII., on "Riveted Joints, Pins and Eyebars, Joints in Timber," the author recommends Skeleton & Co.s "Handbook No. 10," "Carnegie's Pocket Companion" and British "Standard Sections and Specifications," as well as Fidler's "Notes on Construction" and Unwin's "Machine Design" for information as to various small fastenings and structural details. Riveting is discussed in essential points with a resumé of results of experiments by The Institution of Mechanical Engineers, Watertown Arsenal, Kirkaldy, U. S. Navy Department, Tetmajer and the author. One questionable example shows six cover-plates riveted together for a girder flange. The eye-bar head and pin joint are discussed with sketches of Burr's and Kirkaldy's form (hammer forged) and the hydraulic forged circular head. Cooper's tests of very large bars for the Quebec Bridge are described in a page, with a sketch typifying the process of deformation. Four pages are devoted to discussing four forms of notched splices for timber in tension and two styles of fish-plate joint. It would have been in order here to refer to Jacoby's "Structural Details," which treats this subject very completely and describes at least one much less expensive and more efficient joint than any mentioned by the author.

In Chapter XIV., the author calls attention to papers and experiments on wind pressure by C. B. Bender, Prof. Gaudard (Proc. Inst. C. E., lxix.) Sir B. Baker, Lieut. O. T. Crosby, C. Shaler Smith and Prof. F. E. Nipher and reports of the National Physical Laboratory, giving the essential resulting data and formulas. Stress due to centrifugal action is treated in one paragraph and efforts of brakes on a page and a half. The action of wind on columns supporting a roof truss is explained on two pages.

In Chapter XV., stresses in tall braced steel piers on trestle towers are discussed, and the algebraic expressions for treating one example are shown. One tall timber trestle is illustrated by six sketches of elevations and details, and a brief description is given on half a page.

Chapter XVI. covers the subject of loading of girders and bridges for various kinds of service. The specifications of Cooper and the American Bridge Co. are quoted in extenso, and Waddell's classification and the diagrams for end shear and equivalent uniform loads for his compromise system are presented. A small condensed moment table for wheel-loads on a six-panel Pratt truss is given and, on one page, the position of wheel-loads for maximum moments and shear is discussed.

The design of an ordinary plate-girder deck bridge is developed in the usual way in Chapter XVII. The author calls particular attention to the making of the web splice, under the assumption that the web shares in the resistance to bending moment, as advocated by the late Prof. J. B. Johnson.

*Director of Thayer School of Civil Engineering, Dartmouth College, Hanover, N. H.

For the design of a pin-connected Pratt truss the American Bridge Co.'s standard 150-ft. span is taken for an example, in Chapter XVIII., and worked out in detail, all of the calculations having been made independently by the author. This is followed by similar treatment of a steel Pratt truss highway bridge with riveted connections, 198-ft. span, as designed by the engineers of the Public Works Department, New South Wales.

Chapter XIX. is devoted entirely to the design of what the author terms a Parker truss, "the standard type adopted by the American Bridge Co., and has been designed from their own specifications." It is an eight-panel, pin-connected Pratt truss, with curved upper chord, 200-ft. span, single-track railroad bridge: eight pages and two folding plates show full details.

A brief treatment of swing bridges is given in Chapter XX., on twelve pages. The author distinguishes four classes: bridges on rim-bearing turn-tables; bridges on a center-bearing turntable (central pivot or nest of conical rollers, with or without steadying wheels); bridges partly or completely lifted by a hydraulic central press, and turning on a water center or central pivot; and floating swing bridges, in which a hollow caisson so carries the bridge that only a portion of the load rests upon the pivot or rollers. Examples are cited and briefly described. The analysis of stresses for four approval types of swing-bridge truss is indicated by developing the essential equations. In a paragraph mention is made of other forms of "movable bridges," specifically Waddell's lift-bridge over the Chicago River, the Scherzer rolling-lift bridges and Tower Bridge, London.

In Chapter XXI. the author first develops the theory of the arched rib, hinged at the springing, illustrating by an example. Winkler's formula for calculating the horizontal thrust is given. The effects of temperature stresses are considered and the thrust therefrom computed for a given case. Then follows an outline of the method for an arched rib with fixed ends. Under the heading "Analytical Treatment of Arches" the three-hinged arched rib and braced arch hinged at crown and springing are treated numerically. Then the usual formulas for the two-hinged arch, including the parabolic arch, are developed; in the latter Prof. Greene is followed in making the moment of inertia vary as the secant of inclination of the neutral axis from crown to springing. The arched rib with fixed ends is similarly treated, with the application also of influence lines. In general remarks the author cites results of investigations of Prof. M. A. Howe showing that in case of an arch of 416-ft. span and 67-ft. rise the relative weights of metal for the rigid, two-hinged and three-hinged arches, respectively, are as the numbers 1.00, 1.21 and 1.30. After a page devoted to erection of arched bridges an example of a design for a three-hinged arch is worked out in detail. Suspension bridges consisting of steel cables with a stiffening girder are treated by well known analysis, with some numerical results, in ten pages. Two designs for bridges proposed in Sydney Harbor are shown in general, while three folding plates set forth another design in detail.

The typography and illustrations are clear and excellent in all respects, but the very good paper used is of such weight that the book is unduly heavy to handle.

The range of engineering theory, data and practice embraced within this treatise is covered for American students by the following works: Johnson's "Materials of Construction"; Merriman's "Mechanics of Materials"; Johnson, Turneaure and Bryan's "Framed Structures" and Merriman and Jacoby's "Roofs and Bridges," Part II.; "Cambria Steel" or Carnegie's "Pocket Companion," and the latest standard specifications; also Jacoby's "Structural Details."

It is evident that the author had a difficult task in selecting material from so wide a field to produce a treatise in a single volume. He has recognized the important advances made by American engineers in developing the science and art of engineering. While the book does not "fill a long-felt want" of American engineers or students it has many points of interest and possible use for all, and may be quite useful to those for whom it was prepared.

A Cyanide Handbook.

Reviewed by F. W. TRAPHAGEN,* M. Am. Inst. M. E.

THE CYANIDE HANDBOOK.—By J. E. Clennell, Assoc. Inst. Mining and Metallurgy. Author of "Chemistry of Cyanide Solutions," etc., Cyanide Chemist to the Creston-Colorado Co. New York and London: McGraw-Hill Book Co. Cloth; 6¼ × 9½ ins.; pp. 520; 41 illustrations in the text. $5, net.

Mr. Clennell has long been recognized as an authority on the chemistry of the cyanide process and the publication of such a book by such an author successfully fills another gap in metallurgical literature.

Part I. deals, in its first section, with the history of the development of the process, including the discovery and investigation of the earlier known cyanogen compounds. In the second section of this part a brief general statement of the modus operandi of the cyanide process is given, the treatment being conveniently divided into three parts, namely, the dissolving process, the precipitation process, and the smelting process. Notice is taken of the early difficulties attending the efforts to treat slime-sand mixtures, and the methods used for the separation and collection of the two are described. The various methods of solution-treatment by percolation, agitation, solution-crushing, and of separation of solution from extracted ore by means of the various types of filters are given in considerable detail.

In Part II. the chemistry of the various cyanogen compounds, and the theory of the reactions occurring during the different steps of the process are considered in very great detail. The various methods used, or proposed, for the manufacture of cyanide are also described.

Part III. treats of the mechanical treatment of the ore previous to solution, and with crushing and grinding, screening and classifying and handling the products from point to point in the mill. Various approved types of machines for serving these purposes are figured and described, but the American cyanide man will be disappointed by the omission of those two very useful devices of Dorr's, the mechanical classifier and the continuous slime thickener.

The dissolving process, described in detail in Part IV. of the book, forms one of its most important features. Under percolation, the relative merits of wooden and iron vats are very carefully considered, with the result that the selection of material for vats becomes a matter to be decided mainly by local considerations, rather than through a predomination in merit of the one over the other material.

The leaching process, to be successful, requires very careful charging, neutralization of acid and soluble salts, the application of solutions in such a manner that the charge receives uniform treatment, and often aeration by drainage or turning or sometimes by double-treatment, wherein the charge is removed to a second tank for further treatment, becoming thoroughly aerated during removal.

Very finely divided material, and slimes, require agitation because leaching is prohibited by the slow rate of passage of solution through any considerable thickness of fine ore. Agitation is effected in various ways, by mechanical stirring, by pump circulation, and by various types of air lifts. Because of the fineness of subdivision of the ore particles, of the rapid movement of the dissolving gold in the solution and of the presence of ample oxygen in the solution, this treatment is far more rapid and effective than percolation. The removal of the pregnant solution from the extracted fines is accomplished by decantation of the supernatant solution from the settled slimes, by filter presses, by vacuum filters of the Moore type, or by pressure filters of the Hunt type.

In Part IV. are described the methods used for removing the precious metals from solution and for refining the resulting precipitate. Details of construction of zinc boxes and the general conduct of the precipitation are given in m detail. The mention of the use of potassium anide as a flux for mattes produced in melt precipitates, is worth the attention of cyan men who encounter difficulty in this matter.

Under Part VI., "special modification of the anide process," the following subheads indic the subjects covered (Part VI.). Direct tre ment after dry or wet crushing; crushing w cyanide solution; roasting before cyanide tre ment; use of auxiliary dissolving re-agents; el trolytic precipitation processes; other precipi tion processes; special treatment of cuprifer ores.

The remaining two sections, devoted to saying ores, solutions and products, and to analytical control of the process, are of ve great value to the chemist and assayer havi to do with the cyanide treatment of ores.

The book as a whole is extremely satisfying. It is just what it purports to be—a "Cyanide Handbook"—and no cyanide man can afford not to possess it. Mr. Clennell is to be congratulated upon his success.

*Professor of Metallurgy and Assaying, Colorado School of Mines, Golden, Colo.

CONCRETE FROM SAND MOLDS.—A Practical Treatise Explaining a Simple System of Molding Ornamental and Plain Concrete or "Cast Stone" with Molds of Wet Sand. By A. A. Houghton, Author of "Ornamental Concrete Without Molds," etc. New York: The Norman W. Henley Publishing Co. Cloth; 5 × 7½ ins.; pp. 145; 12 illustrations in the text. $2.

ORNAMENTAL CONCRETE WITHOUT MOLDS.—A Practical Treatise Explanatory of a System of Molding Ornamental Concrete Units with Templates. By A. A. Houghton, Author of "Clay Models and Plaster Molds for Ornamental Concrete," etc. New York: The Norman W. Henley Publishing Co. Cloth; 4¾ × 7½ ins.; pp. 132; 30 illustrations in the text. $2.

The manufacture of concrete into a variety of ornamental forms for decorative units, such as column capitals, sills, moldings, cornices, etc., and for special uses such as benches, vases, tables, etc., is a rapidly growing business. Particularly because it does not require a large outlay of capital for plant and labor, it has been taken up in a small way by a number of men all over the country, who are turning out a fairly creditable product. There is, however, a decided prejudice against the use of such material among the better class of architects on account of the great mass of decidedly inartistic, poorly-made pieces that a number of these small plants produce, and any text-book that can help these minor concerns to approximate the really fine work done by the leading firms in the industry will do much to promote the use of ornamental concrete and recommend it to the architects, who must be interested before there can be any extensive growth in its use. The two books by Mr. Houghton, noted above, if carefully read, should serve this very desirable end.

There are three general methods of casting ornamental forms in concrete, the ordinary dry concrete block molded under pressure, the wet concrete cast in sand, and the dry concrete scraped and formed to its proper curves by the use of a template. The first of these Mr. Houghton does not take up, but the two books take up, respectively, the last two methods. In each of the books the method of preparing the mold or the template is explained carefully and a number of dimensioned examples given. The text is sufficiently technical to inform the trained concrete worker and at the same time in a vein popular enough to interest anyone who wishes to take up concrete molding as a side issue.

HYDRAULIC AND EXCAVATION TABLES.—United States Reclamation Service, F. H. Newell, Director. Washington, D. C.: The Service. Cloth; 4¼ × 6¾ ins.; pp. 117; two illustrations in the text. Paper, $1; cloth, $1.25.

These tables are now issued in revised and enlarged edition in a form to be sold to engineers outside of the U. S. Reclamation Service, for which they were originally intended. The book contains 39 tables, including in that number solutions of Kutter's formula, areas of trapezoidal sections, amounts of material in various cuts, weir discharge values, weight of cast-iron pipe and other valuable data of great use to hydraulic engineers. In convenient form, the book contains much mathematical information and collated data that should warrant its purchase by many engineers.

Sea-Water Distillation.

PRACTICAL MANUAL ON SEA WATER DISTILLATION.—With a Description of the Necessary Machinery for the Process. By Frank Normandy, of the Middle Temple, Barrister-at-Law. London, England: Charles Griffin & Co., Ltd. Philadelphia, Pa.: J. B. Lippincott Co. Cloth; 5¼ × 8 ins.; pp. 244; 25 text illustrations and 16 tables. $2, net.

All mechanical engineers recognize that volumes might be written on distilling processes and apparatus, but even the most interested may be surprised to learn that the single operation of getting fresh water from salt would require a volume of this size for its exposition. Perhaps, as we suspect, this little subject is the author's pet hobby and looms up greater before him, a "barrister-at-law," than before engineers. It is more than a "practical manual" on distilling for, as the preface states, the author has "found it necessary to treat of the fundamental subjects, water, steam, and fuel." The treatment is formal—each topic, and sub-topic even, is presented to the uninitiated reader's attention with all the dignity of a court document. The American reader will grow impatient at the verbose style and will wish the subject matter had been passed through some sort of an editorial distilling treatment similar, perhaps, to those very sea-water processes which the author describes.

In the beginning there are a few words on the phenomena of evaporation and condensation—"vaporization" and "liquefaction" are the precise terms used. Soon the author discloses what salt water really is and how it may be distinguished from the fresh variety. The properties of steam and the measurement of heat are discussed, after which the author naively remarks:

> Having treated of "Steam" and its properties, generally, before dealing with the evaporator, which both uses and generates more of it, it is well first to treat of "Fuel" by which the initial heat is obtained to produce the primary steam.

The composition and the heating valve, as affected by composition, of "(a) Coal and Coke, (b) Patent Fuels, (c) Wood, (d) Petroleum, (e) Coal Gas," are then duly presented. The rest of the book is essentially an exhaustive review of the features of design and the details of operation of evidently prominent British apparatus.

No one will deny that the work is complete and of great value to those who do not know anything about the distilling of sea water as practiced by our English cousins. It would have been a great improvement to the book, however, if the author had eliminated a few almost unhappy expressions which may put the non-technical readers on a wrong track. For instance on page 2, it is stated that oxygen and hydrogen may recombine into water

> "with explosive force *but not imparting heat* as will be seen when dealing with fuels." (Italics ours.—Ed.)

Yet when dealing with fuels it is made plain that this oxidation of hydrogen yields some 62,500 B. T. U. per lb. Errors of omission are found, too; in all the discussions on "hard" waters, nothing is said to enlighten the ignorant reader about the "temporary" and "permanent" hardness he may have heard of. There are a few illustrations the utility of which is questionable. Thus in telling how water behaves, when soluble or insoluble matter is added, it is found necessary to print a bird's-eye view of an empty rectangular measure having a foot-square base and being also about 1¼ ft. high. The reader is distracted to find a reason for its appearance. Fig. 2 is also just about as useful; to explain the abstract concepts of evaporation, a glass jar (in perspective) is balanced on two legs (shown in elevation) under which a blast gas burner (also in elevation) is previously at work. The jar seems to be half full of water and from the top steam is escaping with a violent explosive action.

THE NEW BUILDING ESTIMATOR.—A Practical Guide to Estimating the Cost of Labor and Material in Building Construction, from Excavation to Finish. By William Arthur. Third edition. New York: David Williams Co. Cloth; 4½ × 6¾ ins.; pp. 477; plates and text illustrations. $2.50.

Although the title page of this book bears the imprint "third edition," the preface notes four

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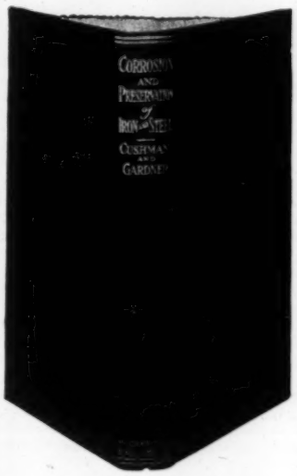

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editions as having been published up to 1907, and the files of Engineering News reveal the fact that the fifth edition was reviewed about a year ago. It is probable, then, that this edition is at least the sixth of Mr. Arthur's very valuable aid to a building estimator. It is just the same as the edition of 1909 (Eng. News, April 15, 1909) except that some 40 pages on concrete and reinforced concrete costs have been added.

High Masonry Dams.

Reviewed by F. C. FINKLE.*

HIGH MASONRY DAM DESIGN.—By Charles E. Morrison, Ph.D., Assoc. M. Am. Soc. C. E., and Orrin L. Brodie, Assoc. M. Am. Soc. C. E., Assistant Engineer Board of Water Supply, New York City. New York: John Wiley & Sons. London, England: Chapman & Hall, Ltd. Cloth; 5¾ x 9¼ ins.; pp. 103; 19 illustrations in the text. $1.50, net.

This little book deserves the appreciation of every engineer who has to do with the design of medium or high masonry dams. The first 52 pages are devoted to a thorough analysis of masonry dam sections from the standpoint of conservative economy. Neither the principles enunciated nor the major portion of the mathematical analyses are new to those who have studied the subject by means of books or independent research. Still it must be admited that never before has the matter been more carefully and clearly presented in as few words, and that at least two phases of the subject are fully discussed in a manner not heretofore done.

These two phases which are not generally assigned the importance they deserve, are the uplift caused by water penetrating the mass of masonry and the horizontal ice thrust acting at the water surface. In both of these the conclusions reached and the formulas presented are as satisfactory as can be expected with the present state of actual knowledge regarding the action of internal water pressure and horizontal ice thrust on dams.

The authors are to be commended for the clear and concise manner in which all the formulas are finally stated, and this fact will make the book useful to the practicing engineer. While the book is too limited in the scope of its investigations to be used as a text-book for students generally, it is of much value to advanced students in preparing for future work along conservative lines of practice.

Appendix 1 is one of the most interesting and instructive parts of the work. It takes up the question of tensions across vertical planes in a masonry dam, which are most generally ignored by designers, and presents Prof. Unwin's method of analysis for the determination of shear on horizontal planes. The relations existing between vertical tension and horizontal shear are fully presented, and the conclusion is reached that the shearing stresses to be provided for are those to be found in the upper levels and near the toe of high masonry dams.

The reviewer believes this part of the subject to be an important one, and that all masonry dams should be fully investigated for the stability of their vertical as well as their horizontal sections. These matters have been discussed more or less by engineers in the technical journals during recent years, but it has remained for Messrs. Morrison and Brodie to be the first to present it in a volume, so as to make the latest knowledge readily accessible to all engineers.

THE CORROSION OF IRON AND STEEL.—By Alfred Sang. New York: McGraw-Hill Book Co. Cloth; 5 x 7½ ins.; pp. 141. $1, net.

A paper read before the Engineers' Society of Western Pennsylvania late in 1908 has been used as a basis for this book. The author states that the work is largely

a compilation and study of the results obtained by other investigators and is intended as a compendium of the subject suitable for reference.

A useful bibliography, condensed from one prepared by Mr. Harrison W. Craver and published by the Carnegie Library of Pittsburg, is reproduced in condensed form at the end of the book.

*Consulting Engineer, 628½ South Spring St., Los Angeles, Cal.

THE ONLY WORK ON THE SUBJECT

MUNICIPAL FRANCHISES

By DELOS F. WILCOX, Ph. D.

Chief of Bureau of Franchises of the Public Service Commission for the First Division of New York

Author of "The American City," "The Study of City Government," "The Government of Great American Cities," etc.

PURPOSE OF THIS BOOK.

The confusion resulting from the changing attitude of public opinion toward public utilities, from the variety of franchises granting authorities, from the lack of information on the part of public officials, from the absence of any consistent or comprehensive public policy relative to franchises in any particular city, and from the multiplicity of constitutional and statutory restrictions imposed by forty-six different commonwealths, has left franchise matters throughout the United States in a deplorable condition. The purpose of this book is to simplify, as far as possible, fundamental conceptions as to the nature and purpose of franchise grants; to state as clearly as possible the necessary conditions to be imposed in connection with various classes of franchises; to describe the best types of franchises actually in force in different cities of the country; and, finally, to discuss in a general way the principles involved in the regulation of public service utilities by means of taxation, rate regulation, public service commissions, the Referendum and municipal ownership. In volume one will be included the preliminary discussion of fundamental principles and illustrative chapters on electric light, telephone, telegraph, signal, electric conduit, water, sewer, heating, refrigerating, pneumatic tube, pipe-line and gas franchises. For volume two will be reserved the chapters on the various classes of transportation franchises and the concluding discussion of taxation and control.

While not hesitating to express his own opinion on controversial matters, the author aims primarily to present an analysis of facts and conditions in such form as to be available for the use of officials having responsibility for granting franchises or enforcing franchise contracts, special students of public affairs, and citizens who, individually or through semi-public organizations, are endeavoring to bring intelligence to bear in a practical way upon the governmental problems of their home cities. While it is not the purpose of the author to cast aspersions upon the intelligence or sincerity of any class of public officials or of politicians in general, it is clear that this book can be useful only to those persons, either officials or private citizens, who are in good faith seeking for light upon this most complex problem and who approach the subject, not from the staudpoint of personal or private interests, but from the standpoint of the public good.

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Chapter XVIII—Oil Pipe Line Franchises.
Chapter XIX—Artificial and Natural Gas as Public Utilities.
Chapter XX—Gas Franchises where Only Artificial Gas is Available.
Chapter XXI—Gas Franchises in Cities Within Reach of Natural Gas Fields.

ANNOUNCEMENT.

The second volume of this work will include parts 3 and 4.

Part 3 will contain an analysis and discussion of local transportation franchises including street railways, interurban lines, terminal railroads, subways, elevated lines, freight tunnels, ferries, coach and cab lines, bridges and turnpikes and toll roads.

Part 4 will comprise the chapters discussing taxation and control of Municipal Franchises, including the following subjects:

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Relation of franchises to land values.
Principles of franchise taxation.
Municipal operation or public regulation.

It is expected that Volume II will be ready within one year after publication of Volume I.

Cloth; 4¼ x 6½ inches; about 720 pages. Price, $5.00 net.

Engineering News Book Department

220 Broadway, New York

History of the Slide Rule.

HISTORY OF THE LOGARITHMIC SLIDE RULE AND ALLIED INSTRUMENTS.—By Florian Cajori, Ph. D., Professor of Mathematics, and Dean of the School of Engineering, Colorado College. New York: The Engineering News Publishing Co. London, England: Archibald Constable & Co., Ltd. Cloth; 5 × 7¾ ins.; pp. 126 + x.; 17 illustrations, partly in the text. $1, net.

This history of the development and use of the slide rule opens with a brief account of the invention of logarithms and of the logarithmic use of numbers, or Gunter's scale. The attempt is made to settle the uncertainty over the invention of the slide rule by citations giving the results of an exhaustive research. The conclusion at first reached by the author is that the slide rule was invented independently about 1630 by both Edmund Wingate and William Oughtred, both English mathematicians. It is rather disconcerting to discover, later on, in the addenda, that the invention is not due at all to Wingate but exclusively to Oughtred.

The development of the forms and adaptations of the slide rule in the 18th century and the first half of the 19th is taken up in the next chapters. The development in England, Germany and France in these periods is taken up separately, and one chapter is devoted to development in the United States in the 19th century. A chapter on development in recent times is followed by a list of the rules designed since 1800, with a brief description and reference for each rule. This list includes a total of 256 slide rules. The book concludes with a bibliography giving nearly 300 references to literature relating to the slide rule, dating from 1620 to 1909, an index and the addenda alluded to above, copy for which, it is announced, was received after the other pages had gone to press. To any one already a student of the slide rule this book will be most acceptable.

BULLETIN OF THE GENERAL CONTRACTORS ASSOCIATION OF NEW YORK.—Published monthly at 2508 Park Row Building, New York City.

This association has begun the publication of a monthly bulletin containing items of general interest to its members, and particularly matter relating to the work of the association with reference to laws and ordinances covering contract work in New York. The issue for April contains 16 pages. The most important articles relate to the matters of pending legislation regarding employers' liability and the eight-hour law in New York.

EXTRACTS ON REINFORCED-CONCRETE DESIGN.—Selected from "Concrete, Plain and Reinforced." By Frederick W. Taylor and Sanford E. Thompson. New York: John Wiley & Sons. London, England: Chapman & Hall, Ltd. Cloth; 6 × 9 ins.; folding plates and text illustrations. $2, net.

The nature of this book is best explained by its own preface, which is as follows:

These Extracts comprise a portion of the new matter relating to reinforced concrete in the second edition of "Concrete, Plain and Reinforced." They are printed in a limited edition for those who already own the complete second edition of "Concrete, Plain and Reinforced," and require for office use additional copies of the formulas, tables and examples on reinforced concrete; and also for

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By William G. Raymond, Dean of the College of Applied Science, State University of Iowa.

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Elements of Plane Trigonometry.
By Robert E. Moritz, Ph. D., Ph. N. D., Professor of Mathematics, University of Washington. 8vo. Cloth.

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Messrs. Taylor and Thompson's text-book is too well known to require additional description; the second edition was reviewed in our issue of Jan. 13, 1910, Engineering Literature Supplement, p. 12.

German Books.

DAS TROCKNEN UND DIE TROCKNER.—Anleitungen zu Entwurf, Beschaffung und Betrieb für alle Zweige der mechanischen und chemischen Industrie, für gewerbliche und für landwirtschaftliche Unternehmungen. By Otto Marr. Munich and Berlin, Germany: R. Oldenbourg. Cloth; 5½ × 8½ ins.; pp. 416; 215 illustrations, mostly in the text. 12 marks; American price, $4.80.

Covering a new field, and a broad one, this work offers information and advice needed in many different industries, artificial drying being practiced in nearly every branch of manufacture at some stage. It deals with its subject in two parts, the first giving the general and theoretical considerations, such as those affecting heat transmission, evaporation, etc., while the second describes and discusses drying machines as actually built for the several different kinds of service: agricultural products, feed, manure (including garbage and sewage), building materials, fuels, chemical and industrial products, etc. The latter, or practical half of the book appears to have the widest utility. Its arrangement (classification) is obviously irrational, but in view of the large number of factors which influence the service of driers this may be pardoned, since in substance every different material or degree of drying demands its own design of plant.

DIE KNICKFESTIGKEIT DER DRUCKGURTE OFFENER BRUECKEN.—By Dr. H. Zimmermann. Berlin, Germany: Wilhelm, Ernst & Sohn. Paper; 6¾ × 9¾ ins.; pp. 53; eight illustrations in the text. 3 marks; American price, $1.20.

For some two or three years the German technical press has contained frequent theoretical discussions of the problem of the column strength assignable to very long compression members supported at intermediate points by non-rigid supports. The principal case is that of the compression chord of a low-truss through bridge, where top laterals are absent and the bending strength of the posts must serve to hold the chord in line. That this problem should not receive much attention in America is readily understandable. Still, some students of applied mechanics may find the German disquisitions of interest. The above pamphlet is important among them. For fair warning we add that it consists wholly of involved algebraic development, employing determinants to solve its final batteries of equations.

DER VEREIN DEUTSCHER INGENIEURE UND SEINE ARBEITEN.—Published in connection with the Brussels Exposition, 1910. Berlin, Germany: Verein Deutscher Ingenieure (Charlottenstr, 43). Stiff paper; 8½ × 6¼ ins.; pp. 47; illustrated.

Numerically the largest engineering society in the world, the Verein Deutscher Ingenieure, has accomplished something besides publishing a weekly technical journal. This may be gathered from a sketch of its history and works which has been prepared on the occasion of the Brussels World's Fair of the present year. The pamphlet is handsomely equipped with pen sketches. Its text, while short, gives a comprehensive account of the society's life.

SYNOPSIS OF THE PATENT LAWS OF THE WORLD. —By John P. O'Donnell, M. Inst. C. E., M. Inst. M. E., M. Am. Soc. C. E., Consulting Engineer and Chartered Patent Agent. (Fifth edition.) London, England: Author. Cloth; 5 × 7¼ ins.; pp. 95. 2s. 6d.; American price, $1.

This little book gives the general requirements for patents, trade marks, etc., with a summary of the laws, rules and fees in various countries.

Publications Received.

AMERICAN SOCIETY OF MUNICIPAL IMPROVEMENTS.—Proceedings of the Annual Convention held at Little Rock, Ark., Nov. 9-11, 1909. (A. Prescott Folwell, Secy., 239 West 39th St., New York.) Paper; 5¾ × 8½ ins.; pp. 432; folding and other plates and text illustrations. $1.50.

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ANNUAL STATEMENTS OF THE RAILROAD AND CANAL COMPANIES OF THE STATE OF NEW JERSEY.—Together with Report of State Director of the United New Jersey Railroad and Canal Co. for the year 1909. (Henry J. West, State Comptroller.) Trenton, N. J.: Pub. Doc. Cloth; 6 × 9 ins.; pp. 251.

BULLETINS U. S. GEOLOGICAL SURVEY.—Geo. Otis Smith, Director. Washington, D. C.: Pub. Doc. Paper; 5¾ × 9 ins.

No. 417: Mineral Resources of the Nabesna-White River District, Alaska, by F. H. Moffit and Adolph Knopf. With a section on the Quaternary, by S. R. Capps. Pp. 64; five plates (two in pocket) and three text illustrations.

No. 430-E: Advance Chapter from Contributions to Economic Geology, 1909. Part 1.—Metals and Non-metals, except Fuels. Iron and Manganese. By E. C. Harder, J. L. Rich, A. C. Spencer, and Sidney Paige. Pp. 56; one folding plate and four text illustrations.

BUREAU OF LABOR STATISTICS (Illinois).—Fifteenth Biennial Report, 1908. (David Ross, Secy.) Springfield, Ill.: Pub. Doc. Cloth; 6 × 9 ins.; pp. 592.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—Report of Annual Meeting, 1910. Vol xxiv., Montreal, Can.: The Society (C. H. McLeod, Secy.) Paper; 6 × 9 ins.; pp. 119; one illustration in the text.

COMMISSIONER OF PUBLIC ROADS (New Jersey).—Annual Report for year ending Oct. 31, 1909. (Frederick Gilkyson, Commissioner of Public Roads.) Trenton, N. J.: Pub. Doc. Cloth; 5¾ × 9 ins.; pp. 215; plates and folding map.

COW FAECES AS A SOURCE OF TUBERCLE BACILLI IN MILK.—By James O. Jordan, Bureau of Milk Inspection, B. L. Arms, Bacteriological Laboratory, Boston Board of Health, Boston, Mass. (Reprinted from the "American Journal of Public Hygiene," Vol. XIX., No. 2, May, 1909.) Paper; 6 × 9 ins.; pp. 7.

THE DISSEMINATION OF DISEASE BY DAIRY PRODUCTS, AND METHODS FOR PREVENTION.—(Papers by various authors.) Circular 153, Bureau of Animal Industry, U. S. Department of Agriculture; A. D. Melvin, Chief of Bureau. Washington, D. C.: Pub. Doc. Paper; 6 × 9 ins.; pp. 57; eleven illustrations.

DIVISION OF MINERAL RESOURCES AND STATISTICS ON THE MINERAL PRODUCTION OF CANADA DURING THE CALENDAR YEARS 1907 and 1908.—Annual Report. John McLeish, B. A., Chief of the Division of Mineral Resources and Statistics. Ottawa, Can.: Pub. Doc. Paper; 6½ × 9¾ ins.; pp. 286.

HANDBOOK OF COST DATA FOR CONTRACTORS AND ENGINEERS.—A Reference Book Giving Methods of Construction and Actual Costs of Materials and La-

...r on Numerous Engineering Works. By Halbert ... Gillette, M. Am. Soc. C. E., M. Am. Inst. M. E., ... Managing Editor, "Engineering-Contracting." ...ond edition. Chicago and New York. The Myron ... Clark Publishing Co. Flexible morocco; 4¾ × ... ins.; pp. 1854; text illustrations and tables. $5.

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...A ENGINEERING SOCIETY.—Proceedings of the ... Annual Meeting held at Cedar Rapids and Iowa City, ...a. Feb. 16-17, 1910. Iowa City, Ia.: The Society ...S. M. Woodward, Secy.). Paper; 6 × 9 ins.; illus-...trated.

...E MANUAL OF STATISTICS.—Stock Exchange Hand-... Book, 1910. 32d Annual Issue. Railroad Securities, Industrial Securities, Government Securities, Stock Exchange Quotations, Mining, Grain and Provisions, Cotton, Money, Bank and Trust Companies. New York: The Manual of Statistics Co. Cloth; 5¼ × 8 ...ins.; pp. 1086. $5.

...TALLOGRAPHY.—By Cecil H. Desch, Graham Young ... Lecturer in Metallurgical Chemistry in the Univer-...sity of Glasgow. London, New York and Bombay: Longmans, Green & Co. Cloth; 4⅜ × 7½ ins.; pp. 429; 14 plates and 108 text illustrations. $3, net.

...AILWAY STATISTICS OF THE UNITED STATES OF ...AMERICA.—For the year ending June 30, 1909. Compared with the Official Reports of 1908 and Recent Statistics of Foreign Railways. By Slason Thompson, Bureau of Railway News and Statistics. Chicago, Ill. The Bureau. Paper; 5¾ × 8¾ ins.; pp. 106.

...E RELATIONS OF RAILWAYS TO CITY DEVELOP-...MENT.—Papers read before the American Institute of Architects, Dec. 16, 1909, New Willard Hotel, Washington, D. C. Washington, D. C.: Board of Directors. (Glenn Brown, Editor.) Paper; 7 × 9¼ ins.; pp. 79; numerous plates.

...SUSCITATION OF SUBJECTS IN A CONDITION OF ...APPARENT DEATH, CAUSED BY CHLOROFORM, ...ELECTROCUTION, ETC.—And other related papers. By Louise G. Robinovitch, B. ès L., M. D. (Reprint from "The Journal of Mental Pathology." Vol. VIII., No. 4, 1909.) New York: State Press (28 West 126th St.). Paper; 6½ × 10¼ ins.; pp. 153 to 200; folding plates and text illustrations. 50 cts.

...F-TAUGHT MECHANICAL DRAWING AND ELE-...MENTARY MACHINE DESIGN.—Prepared for the Use of Practical Mechanics and Young Draftsmen. By F. L. Sylvester. With Additions by Erik Oberg, Associate Editor of "Machinery," Author of "Hand-Book of Small Tools," etc. New York: The Norman W. Henley Publishing Co. Cloth; 4¾ × 7¾ ins.; pp. 333; 218 illustrations in the text. $2.

...IETY FOR THE PROMOTION OF ENGINEERING ...EDUCATION.—Proceedings of the Annual Meeting held in New York City, June 24-26, 1909. Vol. XVII. Edited by Henry S. Monroe, Arthur L. Williston, Henry H. Norris. (Henry H. Norris, Secy., Ithaca, N. Y.) Cloth; 6 × 9 ins.; pp. lxxii + 244; one folding plate and six text illustrations.

...TE FOREST, FISH AND GAME COMMISSION ...(New York).—Reforesting Operations. By C. R. Pettis, State Forester. (Extract from the 15th Annual Report.) Paper; 6½ × 9¾ ins.; pp. 122 to 167; folding and other plates.

...DIES ON THE CARBENES.—By Kenneth Gerard ...Mackenzie. (Reprinted from the "Journal of Industrial and Engineering Chemistry," Vol. 2, No. 4, April, 1910.) Paper; 6¼ × 9¼ ins.; pp. 11.

...STUDY IN HEAT TRANSMISSION.—(The Transmis-...sion of Heat to Water in Tubes as Affected by the Velocity of the Water.) By J. K. Clement and C. M. Garland. Bulletin No. 40, University of Illinois Engineering Experiment Station. Urbana, Ill.: The University. Paper; 6 × 9 ins.; pp. 17; eight illustrations in the text.

...MARY OF COMMONWEALTH STATISTICS OF ...TRANSPORT AND COMMUNICATION.—For the years 1901 to 1909. Transport and Communication, Bulletin No. 3. Published under the authority of the Minister of Home Affairs by G. H. Knibbs, Commonwealth Statistician. Melbourne, Australia: Pub. Doc. Paper; 8¼ × 13 ins.; pp. 39.

...THE TURBINE WATER WHEEL AS A PRIME ...MOVER.—(Address delivered before the Clarkson Engineering Assembly, Feb. 19, 1909.) By Robert E. Horton, Asoc. M. Am. Soc. C. E. (Reprinted from Clarkson Bulletin, Vol. VII., No. 1, January, 1910.) Albany, N. Y.: The Author. Paper; 5¾ × 8¾ ins.; pp. 18; illustrations on four plates.

...TWENTIETH CENTURY HAND-BOOK FOR STEAM ...ENGINEERS AND ELECTRICIANS.—With Questions and Answers. A Practical Nontechnical Treatise on the Care and Management of Steam Engines, Boilers and Electric Machinery. By Calvin F. Swingle, Author of "Encyclopedia of Engineering," etc. Chicago, Ill.: Frederick J. Drake & Co. Leather; 4¾ × 7 ins.; pp. 1481; 696 illustrations, mostly in the text. $3.

...WATER-SUPPLY PAPERS, U. S. GEOLOCICAL SUR-...VEY.—Geo. Otis Smith, Director. Washington, D. C.: Pub. Doc. Paper; 6 × 9 ins.

...Nos 243, 244, 245, 248, 249: Surface Water Supply of the United States, 1907-8. Prepared under the direction of M. O. Leighton.

...Part III. Ohio River Basin. By A. H. Horton, M. R. Hall and R. H. Bolster. Pp. 224; four plates and one text illustration.

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...THE WEATHERING OF COAL.—Series of 1909. By S. W. Parr and W. F. Wheeler. Bulletin No. 38, University of Illinois Engineering Experiment Station. Urbana, Ill.: The University. Paper; 6 × 9 ins.; pp. 43; 15 illustrations in the text.

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